

Surface electromyography of muscle involved deglutition in patients with Parkinson's disease (Abstract)*. Dissertation. Recife 2009.

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Background: Parkinson's disease (PD) is a chronic degenerative disease of the central nervous system resulting from the death of motor neurons in the substantia nigra promoting motor disorders and postural dysfunctions. Parkinson's disease is a neurological disease that most often results in difficulty in swallowing (dysphagia). The incidence of dysphagia in PD is between 50% and 100% of patients and may be present even in the absence of clinical symptoms.

Objective: The aim of this study was to compare the records of surface electromyography (sEMG) of muscles involved in swallowing among individuals with PD and normal, and characterizes the study population through the application of scales to measure the PD, the quality of life and quality of life in swallowing.

Method: This study was approved by the Human Research Ethics Committee. The population of the study was composed of 30 individuals: 15 with idiopathic PD and 15 normal. The equipment used in the study was a 4 channel electromyography of EMG System do Brasil LTDA. The signal received by the electrodes was amplified 2000 times (common mode rejection >120 dB), band pass filtered from 20 to 500 Hz with a scan speed of 8 KHz. The electrophys-

iological parameters examined were the amplitude and duration of electromyographic activity during swallowing. The recorded data were saved in text file and read in Matlab to analyze the signals. The muscles were recorded simultaneously: Orbicularis Oris, Masseter and muscles located in Suprahyoid and Infrahyoid regions. The subjects with PD were analyzed in off phase. Protocol involved at-once swallowing of 10 and 20 ml of water and 5 ml and 10 ml of yogurt and free-swallowing of 100 ml of water. The characterization of the studied population was made by the use of Hoehn Yahr, UPDRS, PDQ-39 and SWAL-QOL scales.

Results: Statistical analysis was made by ANOVA (post hoc comparisons by Tukey's HSD test) or t-test. Some electromyographic variables showed significant differences between PD and normal subjects. The amplitude was significantly affected by volume (larger volume elicited larger amplitude) and consistency (yogurt > water). The duration was significantly affected by condition (Parkinson > normal), volume (larger volume elicited longer duration) and the consistency (yogurt > water). In free swallowing of 100 ml of water the PD subjects took longer to swallow the whole volume and needed a larger number of swallows the normal subjects.

Conclusion: This work showed that the analysis of the amplitude, duration and time course of electromyographic activity can provide important information on swallowing function. The sEMG technique is simple, reliable, reproducible, and comfortable for the patient. It could be used for early detection of swallowing dysfunction, opening the possibility of early intervention. It also can be used to monitoring treatment, as it can be easily repeated as many times as necessary.

Key words: Parkinson disease, deglutition, deglutition disorders, neurophysiology, electromyography.

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